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Article

# What Drives the Participation of Renewable Energy Cooperatives in European Energy Governance?

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## Abstract

What determines the willingness of renewable energy cooperatives (RECs) to strengthen their involvement in politics at the different levels of governments (local/regional, national, transnational)? We address this research question by using data from an original survey distributed to RECs in Germany. The descriptive analysis shows that the RECs are less willing to participate in energy governance at the EU/transnational level than at the national and especially the subnational level. Our analytical findings, first, show that the odds of RECs to participate in governance processes in the future are greater for those RECs that are already involved in such processes. Put differently, we find that engagement in energy governance is affected by path-dependence. Second, participation in subnational governance processes is determined by dissatisfaction with policy decisions taken at that level: the more dissatisfied the respondents, the more likely they are to exert influence in the future. For the Energy Union to realise its aim of incorporating a broader range of stakeholders, the European Commission must highlight the opportunity structure it provides for participating in governance processes.

## Keywords

energy cooperatives; Energy Union; Germany; governance; renewable energy; survey data

## Issue

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## 1. Introduction

In 2015, the European Commission published its Communication on the Energy Union, which calls for a transformation of Europe’s energy governance system (European Commission, 2015). In 2016, a package of accompanying policy measures (“Winter Package”) was presented (see Ringel & Knodt, 2018). The Energy Union represents an ambitious project, which draws on the four pillars of EU energy policy: the functioning of the energy market, the security of supply, the promotion of energy efficiency and renewable energy, and the interconnection of en-

ergy networks (see, e.g., Tosun, Biesenbender, & Schulze, 2015). In addition, the Communication calls for speaking with one voice in international negotiations and assigns citizens an important role in the energy transition, that is a long-term structural change in energy systems to replace energy produced from non-renewable resources by renewable ones (see, e.g., Aklin & Urpelainen, 2018; Cherp, Jewell, & Goldthau, 2011; Fraune & Knodt, 2017, 2018; Unnerstall, 2017; Verbong & Loorbach, 2012). The European Commission’s framework is remarkable, not least for its attempt to further strengthen the role citizens play in energy policy. The Communication that lays

out the framework strategy states that the European Commission's vision of an Energy Union is one "with citizens at its core, where citizens take ownership of the energy transition" (European Commission, 2015, p. 2).

There exist two basic ways of interpreting this role assigned to citizens in the context of the energy transition. First, citizens can play an active role in energy transition by joining local renewable energy projects, among which renewable energy cooperatives (RECs) represent a particularly prominent form (Kalkbrenner & Roosen, 2016; Moss, Becker, & Naumann, 2015; Yildiz et al., 2015). RECs are based on business models where citizens jointly own and participate in renewable energy projects. RECs are characterised by open membership, democratic member control, economic participation through direct ownership, independence, cooperation among other cooperatives, and concern for the community. Second, citizens can play a more passive role by (not) accepting the implementation of local-level renewable energy projects such as the creation of wind parks (Fraune & Knodt, 2017, 2018; Scherhauser, Höltinger, Salak, Schauppenlehner, & Schmidt, 2017).

In this study, we are interested in RECs as organisations that consist of citizens who join them voluntarily (see, e.g., Radtke, 2014). The literature on the determinants of citizens' willingness to join a REC is insightful. Kalkbrenner and Roosen (2016), for example, stress the importance of social norms, trust, environmental concern and community identity as important factors affecting the citizens' willingness to participate in RECs. We do not aim to contribute to that perspective. Instead, and in line with the aims and scope of this special issue, we consider RECs as collective actors and investigate their willingness to exert political influence. Put differently, we adopt a governance-oriented approach to RECs and examine their (potential) role in a broader institutional setting.

What determines the willingness of RECs to strengthen their involvement in politics at the different levels of governments (local/regional, national, transnational)? This is the research question that guides our analysis. The answer to this question provides important insights concerning the Energy Union's goal to strengthen the citizens' ownership of the energy transition, since citizen-based RECs play an important role in the energy transition. The European Environment Agency (2017, p. 13), for example, recognises RECs as key actors in energy governance. In Germany, RECs account for about 55% of the community-based energy sector (Kahla, Holstenkamp, Müller, & Degenhart, 2017, p. 16), which makes them important actors in energy governance. In this context, we examine Germany-based RECs' willingness to participate in energy governance at the local/regional, national, and transnational levels. We use data from a survey of the executive boards of RECs in Germany, collected in 2016/2017, that produced complete responses from 174 RECs.

The remainder of this study unfolds as follows. First, we provide some background information on how the

EU's energy governance has developed and to what extent citizens are now invited to participate in governance. Next, we turn to the European Federation of RECs (REScoop.eu) to show that an interest group representing RECs and their members has already been set up. We then develop a theoretical argument on the determinants of the willingness of RECs to exert political influence. The theory section is followed by the empirical analysis and a discussion of the findings. The final section then provides some concluding remarks and suggestions for future research.

Our empirical analysis reveals two important findings. First, a powerful predictor for RECs to exert influence in the future is their current involvement in governance processes. Second, dissatisfaction with policy decisions taken at the local level increases the odds of RECs to consider involvement in subnational governance processes. Concerning the other political levels, our analysis does not find that the level of dissatisfaction matters.

## 2. What Role to Play for Renewable Energy Cooperatives in the Energy Union?

In this study, we seek to offer an analysis of how RECs participate in European energy governance. We define energy governance as energy-related activities by state actors that is complemented by a multilevel and a multi-actor process (Bazilian, Nakhouda, & Van de Graaf, 2014, p. 219). In the case at hand, the multilevel system consists of state and non-state actors that are active at the local/regional, national, and transnational/European levels. The multi-actor component refers to the interaction between different types of state actors (e.g., federal governments and regional governments) as well as their interaction with non-state actors, such as non-governmental organisations (NGOs) or citizen-based organisations such as RECs.

The point of departure for this analysis is the Energy Union, which the European Commission launched in February 2015 and which seeks to establish a new form of energy governance in the EU. The idea of founding an Energy Union was introduced by Donald Tusk when he was still Prime Minister of Poland, which aligns with the country's continued concerns over disruptions in energy supply (see Marcinkiewicz & Tosun, 2015). The European Commission's (2015, p. 4) strategy for realising the Energy Union builds on the following five dimensions:

- Energy security, solidarity and trust;
- A fully integrated European energy market;
- Energy efficiency contributing to moderation of demand;
- Decarbonising the economy; and
- Research, innovation and competitiveness.

The mutual realisation of these five dimensions is expected to increase the EU's energy security, its sustainable development and competitiveness. The Communi-

cation is remarkable in the sense that it frequently mentions citizens; in fact, citizens are often highlighted as the beneficiaries of the Energy Union. However, the European Commission (2015, p. 2) also stresses that it expects citizens to “take ownership of the energy transition”. Consequently, in its section on the governance of the Energy Union, the communication stipulates the need to establish arrangements that facilitate “an energy dialogue with stakeholders to inform policy-making and support active engagement in managing the energy transition” (European Commission, 2015, p. 18). In other words, the Commission invites citizen-based organisations to become involved in energy governance.

The Energy Union is a new umbrella that brings together the elements of EU energy policy into an integrated approach, as well as a continuing process since, when the concept was adopted, it was still an “empty box” (Szulecki, Fischer, Gullberg, & Sartor, 2016). A step towards the realisation of the Energy Union is the “Clean and Secure Energy for All Europeans”-Package or “Winter” Package published in November 2016, which also contains a proposal for the “Regulation on Governance of the Energy Union” (European Commission, 2016a, 2016b; for a discussion, see Ringel & Knodt, 2018; Szulecki et al., 2016). Another important instrument is the annual progress reports prepared by the European Commission. In the most recent report, the European Commission (2017, p. 1) stated, “[n]ow is the time to mobilise all of society—citizens, cities, rural areas, companies, academia, social partners—to take full ownership of the Energy Union, take it forward and engage in developing the solutions of the future”.

Despite mentioning the importance of citizen-based organisations in realising the Energy Union’s goals, the strategic documents produced by the European Commission to date abstain from specifying what role citizens are exactly expected to play in the emerging governance arrangements. The lack of definitional clarity might prove problematic, since individual citizens or citizen-based organisations may not feel addressed if the Commission does not extend an invitation for their involvement and engagement.

Additionally, participation of citizen-based organisations, such as RECs, in energy governance may be inhibited by transaction costs (see Coase, 1988; Dahlmann, 1979; North, 1992; Williamson, 1981). Building on the original notion of transaction costs as associated with the work of Coase (1988), Tosun, De Francesco and Peters (2018) argue that policies, despite representing one specific form of an institution, can fail to lower transaction costs if they are ambiguous. Therefore, not only the existence, but also the design of institutions matters for stimulating efficiency (see also Coase, 1988). Applying this argument to the case of the Energy Union, the Commission is unlikely to attain its goal of increasing the involvement of stakeholders in energy governance if it does not detail how participation is to be facilitated. In other words, if RECs must invest to learn about their opportunities for

participation, they may lack the capacity and/or willingness to become involved once they have gathered all necessary information. Thus, by defining the formats as precisely as possible, the Commission will be in a position to reduce the transaction costs and better stimulate stakeholder involvement in energy governance.

Szulecki et al. (2016) interpret the vagueness in the conceptualisation of the Energy Union differently. To these authors, the lacking details provide an opportunity structure for the various actor groups to participate in the process and to shape the institutional design in a way that reflects their own preferences. This perspective is equally plausible; but when looking at the different stakeholder groups, including RECs, they may lack the capacity and/or power to make such strategic use of the situation and to push for the realisation of their respective preferences concerning the institutional design of the Energy Union.

### 3. European Federation of Renewable Energy Cooperatives

In this section, before turning to the presentation of our theoretical argument, we discuss the most pertinent type of transnational networks active in the field of EU energy governance. Set up in 2013, REScoop.eu is the European Federation of RECs, which currently comprises about 1,500 RECs. The organisation offers a platform to citizens who engage in energy cooperatives and strives to aggregate and articulate their interests towards EU policy-makers. REScoop.eu recognises full and associated members; both types of members are involved in energy governance processes.

The federation is governed by a board of directors, which is elected by the general assembly for a four-year term, with the members being eligible for re-election. The board takes decisions related to policy, strategy and planning, as well as controls the budgets and supervises the coordinator. The general assembly comprises all members, including both full members and associate members. Full members have voting rights and are either individual RECs or national or regional federations. Associate members do not have voting rights and are non-governmental organisations, associations, companies or individual citizens.

The organisational purpose of the federation is twofold: on the one hand, REScoop.eu provides guidance on best practices and seeks to stimulate learning processes among RECs; on the other, it formulates position documents with a view to impact policy-making. REScoop.eu also participates in the EU-funded Horizon 2020 project “Renewable Energy Cooperatives Mobilizing European Citizens to Invest in Sustainable Energy” (REScoop MECISE) as well as other Horizon 2020 projects (see Huybrechts, Creupelandt, & Vansintjan, 2018), which shows how strongly the organisation is rooted in the EU.

Table 1 gives an overview of REScoop.eu members, broken down into full and associate members. It is im-

portant to remember that many individual energy cooperatives are members of REScoop.eu through their national federation, that is, they are represented indirectly. Among the full members are national and regional federations of RECs and individual cooperatives. When examining the table, it becomes apparent that German RECs are well represented in the network through the German Cooperative and Raiffeisen Confederation (DGRV). According to the most recent survey (see Fischer & Wetzel, 2018), the number of RECs in Germany equalled 928 in 2015, whereas the DGRV (2017) represented 862 RECs by the end of 2017. Although both take into account new foundations since 2006 please note that the figures from Fischer and Wetzel (2018) and DGRV (2017) are not fully comparable due to different timescales and different accounting methods. We cannot, for instance, preclude that the DGRV (2017)—although only a negligible share—takes non-REC cooperatives into account. From correspondence with REScoop.eu (Creupelandt, 2018, personal communication), we conclude that all RECs represented by the DGRV are also represented in REScoop.eu. If we consider the number of RECs identified by Fischer and Wetzel (2018), we can still confirm that more than 90% of the German energy cooperatives are—at least indirectly—represented in this particular network. Both are impressive numbers and suggest that it is worth looking at RECs in Germany in detail (see also Klage & Meister, 2018).

Another country that is well represented in the network is the United Kingdom, followed by energy cooperatives in the Netherlands, Belgium, Spain, Italy, and Switzerland. Croatia, Denmark, France, Greece, Ireland, and Portugal participate in the REScoop.eu by means of individual energy cooperatives. Turning to the three associate members, these are the EMES research network of university research centres and individual researchers

on social enterprise in Belgium, ALLenergy (an energy agency) in the United Kingdom, and BBEn (a citizen energy alliance) in Germany.

In the following sections, we will concentrate on German RECs for the following three reasons. First, RECs exist in large numbers in Germany (Kahla et al., 2017). Second, RECs represent an “important building block in the energy transition in Germany” (Yildiz et al., 2015, p. 59). Third, as shown above, RECs in Germany are widely represented in transnational networks, which suggests that we can draw particularly valuable insights concerning the RECs’ willingness to participate in EU energy governance.

#### 4. Theoretical Considerations and Hypotheses

The research interest of this study concerns the conditions under which RECs become willing to engage in energy governance at the subnational, national and EU levels. We assume RECs—similar to other strategic actors—to be sensitive to the expected costs and benefits of becoming involved in governance arrangements. In most cases, RECs are managed by volunteers with limited capacity (see e.g., Herbes, Brummer, Rognli, Blazejewski, & Gericke, 2017; Müller et al., 2015; Radtke, 2014), which make considerations of costs and benefits particularly pertinent for explaining the (intended) behaviour of RECs. Consequently, RECs are likely to become involved in governance arrangements if the expected benefits exceed the expected costs. The benefits of participating in energy governance for RECs primarily consist of the possibility to influence policy decisions in such a way that renewable energy projects can be implemented more easily and under more favourable conditions. Since the Energy Union is currently under construction (see Ringel & Knodt, 2018), we are interested in the determinants of future involvement in energy governance rather

**Table 1.** Overview of REScoop.eu members, 2018.

	Full members		Associate members
	Federations	Individual	
Belgium	25	5	1
Croatia		1	
Denmark		1	
France		3	
Germany	850*	2	1
Greece		3	
Ireland		2	
Italy	20	4	
Netherlands	56	1	
Portugal		1	
Spain	17	5	
Switzerland	20		
United Kingdom	198	3	1

Notes: Own elaboration based on <https://www.rescoop.eu/members> (last access 6 October 2018). \*Note the particularity for Germany that RECs are represented in REScoop.eu through their membership in the DGRV. According to the DGRV (2017), by the end of 2017, there existed 862 RECs in Germany. To avoid confusion, in the table we only report the figures retrieved from the website of REScoop.eu.

than current engagement. Further, our analysis examines the three levels at which RECs could become involved, namely the subnational, national and EU levels.

The current level of engagement is, however, an important factor for explaining future activities—as studies on organisational behaviour rooted in historical institutionalism also argue (see Thelen, 1999). We expect those RECs that are already active to be more likely to participate in governance arrangements in the future as well. This expectation is informed by the variation in the transaction costs (Coase, 1988), which comprise costs related to searching and processing information, bargaining, and monitoring and enforcement (Dahlman, 1979, p. 148). By reducing transaction costs, for example by creating appropriate institutions (North, 1992), decision-making can become more efficient (Williamson, 1981). The transaction costs should be low for RECs that already participate in governance at a given political level, but higher for RECs that do not participate in governance arrangements at the same political level. In other words, investing once in gathering information about the existence and functioning of governance arrangements generates “increasing returns” (Pierson, 2000), which explains why RECs that already participate in energy governance are also more likely to participate in it in the future. This reasoning paves the way for our first hypotheses:

H1a: RECs that currently participate in governance arrangements at the subnational level are more likely to participate in such governance arrangements in the future.

H1b: RECs that currently participate in governance arrangements at the national level are more likely to participate in such governance arrangements in the future.

H1c: RECs that currently participate in governance arrangements at the EU level are more likely to participate in such governance arrangements in the future.

The first hypothesis focuses on the transaction costs associated with participating in governance arrangements but does not take into account the fact that RECs can choose between multiple venues for their engagement in EU energy policy, that is, the subnational, national and transnational/EU levels. To formulate hypotheses, we can think of RECs as advocacy organisations that strategically select one or more venues for participating in energy governance (see Holyoke, Brown, & Henig, 2012). The EU’s multilevel system offers multiple points of access or opportunity structures (Princen & Keremans, 2008) to RECs that are willing to participate in energy governance. Some RECs should have the capacity (i.e., funding and personnel; Eising, 2007) to be active at the various levels of the EU political system (Eising, 2008), whereas RECs with limited capacity must choose in which institutional level they want to participate in governance activities, if any. While we need to take capacity into

account when fitting our estimation models, this variable cannot explain which of the three levels available—subnational, national, transnational/EU—will be chosen by RECs.

A variable that has a greater potential for explaining the selection of a political venue is satisfaction. According to Hadjar and Beck (2010), political interest and participation is generated by dissatisfaction with policy decisions. Following this reasoning, we expect that RECs—which are generally limited in their resources—will select the political level with which they are unsatisfied for participating in governance processes. A similar argument is put forward by Pleines (2010, p. 241), who explains that civil society organisations from Central and Eastern Europe are heavily involved in governance processes at the EU level since they are dissatisfied with EU policies. Drawing from these considerations put forward in different literatures (interest group behaviour and political participation), we formulate the following hypotheses:

H2a: RECs that are dissatisfied with policy decisions at the subnational level are more likely to participate in governance activities at that level in the future.

H2b: RECs that are dissatisfied with policy decisions at the national level are more likely to participate in governance activities at that level in the future.

H2c: RECs that are dissatisfied with policy decisions at the EU level are more likely to participate in governance activities at that level in the future.

## 5. Data and Methods

This analysis is based on an original dataset constructed by using data from an online survey administered between November 2016 and March 2017. Drawing from the website [www.energiegenossenschaften-gruenden.de](http://www.energiegenossenschaften-gruenden.de), we identified a total number of 762 RECs to form the population, which left us with a figure smaller than the 928 RECs identified by Fischer and Wetzel (2018). Of the 762 RECs, we could only find contact details in the form of email addresses for 616. In November 2016, we contacted the executive board members of these RECs via email and invited them to participate in the online survey. The RECs were contacted a second time in December 2016 and a third time in January 2017 to remind them of the survey and to re-extend our invitation. Of the 616 RECs to receive an email invitation, 174 management board representatives completed the online survey for their REC, which corresponds to a response rate of 28%. It is important to remember that the data collected reflects the perspective of the REC executive board members only and that asking the individual members could have produced different answers (Holstenkamp & Kahla, 2016). Since we are interested in strategic decisions made by RECs, approaching the executive board members appeared an adequate strategy. The



responses were treated anonymously according to the relevant German data protection laws.

Before fielding the online survey programmed in Lime Survey, it was pretested in September and October 2016 with 10 students and three selected representatives of two local RECs for checking the comprehensiveness, meaningfulness and length of the questions. While we did not receive any critical response regarding the length of the questionnaire, we changed the wording of some questions to make them more intuitive in light of the feedback we received. For instance, while we are interested in participation in governance processes, the pretest of the survey questionnaire revealed that “exerting influence” is the proxy for this construct, which is best understood by the respondents.

In what follows, we analyse the following questions as outcome variables, which comprise the response categories “yes”, “no”, “don’t know” as well as “no response”:

- Is your cooperative intending to exert influence at the community level in the future?
- Is your cooperative intending to exert influence at the regional level in the future?
- Is your cooperative intending to exert influence at the federal level in the future?
- Is your cooperative intending to exert influence at the European level in the future?
- Is your cooperative intending to exert influence at the transnational level in the future?

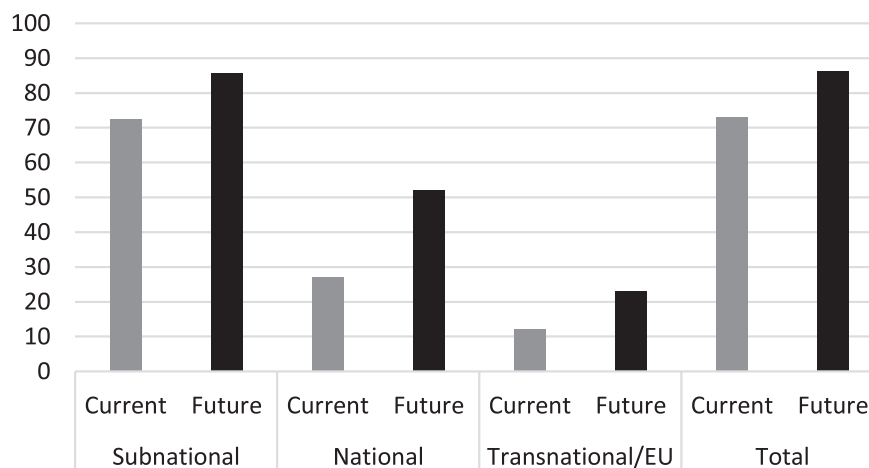
We deleted the latter two response categories (“don’t know” and “no response”) to construct a binary outcome variable that takes the value 1 if a level was mentioned and 0 if not mentioned. We combined the community level and the regional level to generate the outcome variable *Subnational Future* (1 if either or both were mentioned, 0 if not). The question on the federal level is the second outcome variable *National Future*. For the third outcome variable, *EU/transnational Future*, we combined the European and the transnational levels (1 if either or both were mentioned, 0 if not).

Table 2 presents the response patterns we obtained for the intention to participate at the various levels—subnational, national, and EU/transnational—in the future (outcome variables) and the current engagement (one of the focal explanatory variables, which is also binary). There are several observations in the table worth noting. The first one refers to the low share of respondents (12%), indicating that they currently exert influence at the EU/transnational level. Recalling Table 1 and the information provided in section 3 (that German RECs are automatically members of REScoop.eu), the response pattern suggests that most RECs are not aware of their potential to exert influence at the EU/transnational level. This mismatch between the membership in REScoop.eu and the RECs awareness of it can be explained by their indirect membership through the DGRV. If they exert influence, with most RECs (72%) it is at the subnational level, followed by the national level with 27%. Note that the respondents could indicate multiple political levels at which they exert influ-

**Table 2.** Overview of current and future influence by German RECs.

Variables	No ( = 0) Absolute numbers Percentage	Yes ( = 1) Absolute numbers Percentage	Descriptive statistics
Subnational Current	48 27.59%	126 72.41%	N = 174, Mean = 0.724, Standard Deviation = 0.448
Subnational Future	25 14.37%	149 85.63%	N = 174, Mean = 0.856, Standard Deviation = 0.352
National Current	119 73.01%	44 26.99 %	N = 163, Mean = 0.270, Standard Deviation = 0.445
National Future	67 47.86%	73 52.14%	N = 140, Mean = 0.521, Standard Deviation = 0.501
EU/transnational Current	153 87.93%	21 12.07%	N = 174, Mean = 0.121, Standard Deviation = 0.327
EU/transnational Future	134 77.01%	40 22.99%	N = 174, Mean = 0.230, Standard Deviation = 0.422
Current	47 27.01%	127 72.99%	N = 174, Mean = 0.723, Standard Deviation = 0.445
Future	24 13.79%	150 86.21%	N = 174, Mean = 0.862, Standard Deviation = 0.346

Note: The numbers reported refer to the 174 RECs that completed the survey; incomplete and partly completed surveys were disregarded.



**Figure 1.** Bar graph of the current and future influence of RECs.

ence. Regarding future influence, it is again the subnational level where 86% of the RECs intend to become active, followed by the national level (52%) and then the EU/transnational level (23%). Figure 1 offers a visualisation of the numbers reported in table 2.

The second set of focal explanatory variables refers to the degree of dissatisfaction with renewable energy policy decisions at the subnational, national and EU levels. The response categories range from 4 (= very unsatisfied) to 1 (= very satisfied). We treated “don’t know”-replies as missing data.

In addition to the two sets of focal explanatory variables, current influence and dissatisfaction with policy decisions taken at the various political levels, we include a number of control variables. As discussed in the theory section, the literature on interest group behaviour suggests that capacity plays an important role (see, e.g., Eising, 2007). Therefore, the RECs’ willingness to participate in governance processes and exert influence should depend on their *Age* (in years; reference year = 2017), which is a rough indicator of how established and professional they are. *Membership Size*, in eight categories, 1 (smaller than 50) to 8 (greater than 1000), is equally important for assessing the capacity of RECs, since we expect RECs with a greater membership size to benefit from more personnel and to be in a better position to seek influence in the future. Likewise, the RECs’ *Invest-*

*ment* volume (ranging from 1 = below 200.000 EUR to 4 = above 3 million EUR) is an indicator of their organisational capacity. Furthermore, we need to control for the self-understanding of the individual RECs, in the sense of whether they seek *Political Engagement* at all (1 = yes, 0 = no) and whether influencing political decisions is the most important goal (1 = yes, 0 = no) of the respective REC. Thus the control variables relate to capacity and *Political Ambition* of the RECs, which aligns with the literature on interest group advocacy in multilevel systems (Eising, 2008). Table 4 reports the summary statistics for the individual explanatory variables, excluding the first set of focal explanatory variables as they are already presented in Table 2. The wording of the questions used for the operationalisation of all variables can be found in Table A3 (Annex).

In the next section, we will estimate logistic regression models for the first two outcome variables. Since we cannot estimate conventional logistic regression models for future engagement at the EU level due to the markedly unequal distribution of the values, the chosen method is penalised maximum likelihood estimations as put forth by Firth (1993). Observing very few events of interest is not a problem per se, and, in many cases, estimating regular logistic regression models does not produce biased results. With the data at hand, however, the problem of rare events is paired with a small

**Table 4.** Descriptive statistics.

Variable	N	Mean	Std. Dev.	Min	Max
Subnational Dissatisfaction	171	2.611	.703	1	4
National Dissatisfaction	174	3.552	.650	1	4
EU Dissatisfaction	156	3.391	.658	1	4
Age	174	5.914	2.447	1	22
Membership	173	3.497	1.662	1	8
Investment	172	2.459	1.099	1	4
Political Engagement	174	.937	.244	0	1
Political Ambition	174	.086	.282	0	1



number of observations. Since estimates based on unconditional maximum likelihood functions tend to become inaccurate when confronted with a small number of cases, we need to implement the correction offered by Firth's estimator.

## 6. Presentation and Discussion of the Results

We now turn to the empirical testing of the hypotheses put forward in Section 4. Table 5 presents the findings of the logistic regressions (estimated according to Firth's approach for the third outcome variable). The table presents two models per outcome variable: one variable with the focal explanatory variables only (Basic) and a second one that includes the control variables (Full). The models differentiate between the subnational (Sub), national (Nat), and EU/transnational (EU) levels. For a better interpretation of the estimation results, odds ratios are reported. Odds ratios greater than 1 indicate that the odds for a given outcome are higher, whereas odds ratios smaller than 1 indicate that the odds are lower. As we can infer from the table, the odds of RECs to exert influence at the subnational level is 65 times higher for RECs that already exert influence at that level. For the national level, the odds are 37 and 50 times higher for

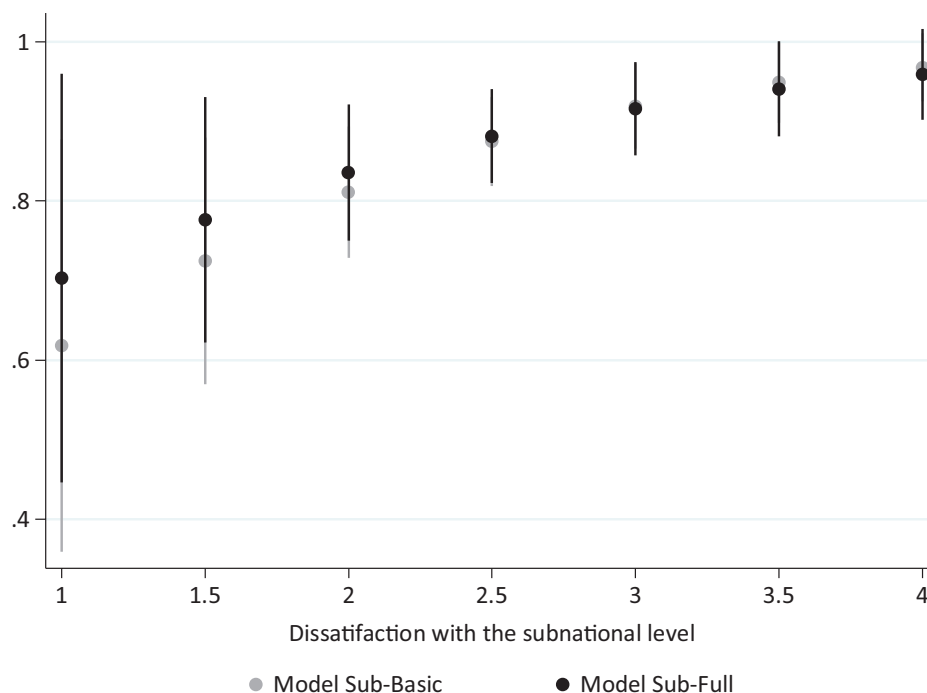
RECs to exert influence at that level. Likewise, current exertion of influence at the EU level increases the odds for future engagement at that level by 74 and 71 times. Consequently, the empirical findings support hypotheses H1a–H1c. Regardless of the respective political level, the current engagement in governance arrangement is a strong predictor of future engagement.

Turning to the second set of explanatory variables, dissatisfaction with policy decisions taken at the subnational level increases the odds of RECs to seek influence in the future at the same political level, which supports H2a. Figure 2 presents the predicted probabilities for the RECs to answer that they intend to exert influence at the subnational level in the future and how the probability changes with the degree of satisfaction with subnational policy decisions. The estimates are based on the models Sub-Basic and Sub-Full in Table 5. While the probability that a REC will seek to exert influence at the subnational level in the future begins with .62 (Sub-Basic) and .70 (Sub-Full), respectively, it increases with growing dissatisfaction with the policy decisions taken at that level. The probabilities vary for the first three values of dissatisfaction for the two model specifications, but converge with values greater than 2. It should also be noted that, for the values smaller than 2, the 95% confidence inter-

**Table 5.** Results of the logistic regression models for the three outcomes variables.

	Sub-Basic	Sub-Full	Nat-Basic	Nat-Full	EU-Basic	EU-Full
Subnational Current	64.74 (54.46)***	64.43 (59.92)***				
National Current			36.98 (28.50)***	49.76 (41.80)***		
EU/transnational Current					74.15 (64.79)***	71.12 (67.48)***
Subnational Dissatisfaction	3.72 (1.94)**	3.49 (1.95)**	1.14 (0.37)	1.46 (0.54)	1.46 (0.52)	1.62 (0.65)
National Dissatisfaction	1.39 (0.84)	1.28 (0.83)	1.55 (0.68)	2.18 (1.10)	0.93 (0.46)	1.09 (0.58)
EU Dissatisfaction	0.76 (0.47)	0.83 (0.55)	0.83 (0.35)	0.78 (0.36)	1.31 (0.63)	1.22 (0.58)
Age		1.18 (0.20)		0.93 (0.12)		0.88 (0.12)
Membership		0.93 (0.25)		0.73 (0.14)*		0.74 (0.15)
Investment		0.85 (0.32)		2.30 (0.74)***		1.50 (0.45)
Political Engagement		1.12 (1.10)		3.56 (4.39)		3.05 (4.52)
Political Ambition		—		1.90 (1.94)		0.63 (0.80)
Cases	154	140	123	121	154	151
AIC	76.97	82.01	129.94	129.09	109.59	103.62

Notes: The table reports odds ratios; the models for the EU are estimated with the Firth correction; in Model Sub-Full, the odds ratios for political ambition are omitted from the estimation routine because of this variable's dependence on other variables in the model. Table A6 in the Annex contains a fourth model that uses the total share of positive replies by REC executive board members regardless of the political level as an outcome variable. \*  $p < 0.10$ , \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .



**Figure 2.** Predicted probabilities for future engagement at the subnational level with 95% confidence intervals for the models Sub-Basic and Sub-Full.

vals are also comparatively great, which can be explained by the smaller number of observations for these categories. Alternative specifications of the estimation models reported in Tables A7 and A8 (Annex) confirm the importance of dissatisfaction with the subnational level for the RECs' intentions of becoming active in governance arrangements in the future. For the other political levels, we do not find any empirical support in the models and therefore must reject hypotheses H2b–H2c.<sup>1</sup>

With regard to the control variables, it is worth noting that they do not produce significant odds ratios. Only in Model Nat-Full is the odds ratio significant at the 10%-level and smaller than 1, indicating that a greater membership size reduces the odds of exerting influence in the future at the national level. When inspecting the Akaike Information Criterion (AIC), we can also see that the control variables do not always improve the fit of the models. Since smaller AIC values indicate a better fit, we can note that Model Sub-Basic performs better than Model Sub-Full. For the second outcome variable, the improvement in the model fit is minimal, but for the third outcome variable the control variables indeed improve the model fit.

To summarise, we can conclude that the empirical findings support hypotheses H1a–1c and H2a. The empirical findings corroborate the importance of the current engagement in governance arrangements for future engagement as well as the mobilisation power of dissatisfaction with policy decisions taken at the subnational level for the odds of RECs to consider exerting influence in the future. We consider both findings relevant for the

European Commission's intention of increasing the participation of stakeholders in energy governance in the context of the Energy Union. First, we observe a path-dependent process, which may lead to a selective participation of (German) RECs in EU energy governance. Second, it is dissatisfaction (at the subnational level) that mobilises RECs rather than satisfaction, which also suggests that (German) RECs will consider carefully whether to become involved in energy governance (at the subnational level).

## 7. Conclusions

With its commitment to form an Energy Union, the EU offers an opportunity structure for stakeholder engagement and a way to decentralise energy governance. The descriptive part of this analysis has shown that an important stakeholder group in Germany—RECs—is currently only marginally involved in energy governance, mostly at the subnational level. This suggests that the German RECs' willingness and/or capacity to become involved in energy governance at the EU/transnational level is limited. This finding is plausible, considering that most members of RECs are active on a voluntary basis and that becoming involved with energy governance, even at the local level, entails considerable effort and can easily overwhelm volunteers. Research has shown that the management duties of executive REC board members are increasing, which limits their capacity for other activities (see e.g., Herbes et al., 2017; Müller et al., 2015;

<sup>1</sup> Table A8 (Annex) reports models that contain even fewer variables to check the robustness of the findings for the focal explanatory variables. However, the model fit of the reduced models reported in Table A8 is worse and suggests that relevant variables are missing.

Radtke, 2014). From that perspective, it is hardly surprising that we could not observe a more marked commitment to participate in energy governance arrangements. However, we were able to observe that RECs are considering becoming (more) active in the future, which holds true both for RECs that are currently exerting influence in subnational governance arrangements and those that indicated (great) dissatisfaction with policy decisions taken at that level.

What are the broader implications of this finding for the European Commission's plea to bring citizens and stakeholders to the core of the Energy Union? Most importantly, the findings suggest that the participation of stakeholders in EU energy governance is being inhibited by barriers, which need to be addressed by the governance arrangements that are still being decided (see Ringel & Knodt, 2018). Compared to citizen-based groups such as RECs, business interests and energy suppliers are likely to be in a better position to seize the new opportunity structure that the European Commission offers with the Energy Union. It is therefore important to point out to organisations such as RECs that the Energy Union offers them an opportunity structure for participating in governance processes beyond the subnational and national levels.

On the other hand, it was encouraging to see that some German RECs are interested in participating in EU energy governance, even though the great majority of respondents indicated that they prefer to strengthen their activities and engagement at the (sub-)national level. The participation of RECs in energy governance can strengthen their role in attaining low-carbon energy transition (see Cherp, Vinichenko, Jewell, Suzuki, & Antal, 2017).

Despite the insights offered by this study, we also need to mention its limitations. First, our analysis concentrated on RECs in Germany only, which makes it difficult to draw conclusions for RECs based in other EU member states. A specific feature of RECs in Germany is that, for many years, RECs benefitted from comparatively generous feed-in tariffs and that their recent reduction resulted in significant frustration with policy-making (see Böhringer, Cuntz, Harhoff, & Asane-Otoo, 2017). A second limitation concerns the small sample size, which forced us to estimate models that contain relatively few explanatory variables. Third, we have cross-sectional data only and, considering the changes to renewable energy policy in Germany (most importantly, the reduction of the feed-in tariffs), it would have been useful to have had a dataset at our disposal that dated back to a year before 2014 when the previous regime was still in place.

Despite these limitations, we believe that this study makes a first, and important, contribution towards better understanding the Energy Union's potential for reaching out to a more diverse set of stakeholders and for determining which governance arrangements it can realistically stimulate.

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## Conflict of Interests

The authors declare no conflict of interests.

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## Annex

**Table A3.** Wording of the questions from the online survey (translated from German).

Variable	Wording of question in online survey	Coding
<b>Outcome variables</b>		
<b>Subnational Future</b>	Which political level is your cooperative intending to influence in the future? [community; regional]	Binary variable (yes = 1; no = 0)
<b>National Future</b>	Which political level is your cooperative intending to influence in the future? [federal]	Binary variable (yes = 1; no = 0)
<b>EU/transnational Future</b>	Which political level is your cooperative intending to influence in the future? [European; transnational]	Binary variable (yes = 1; no = 0)
<b>Focal explanatory variables</b>		
<b>Subnational Current</b>	Which political level is your cooperative currently influencing? [community; regional]	Binary variable (yes = 1; no = 0)
<b>National Current</b>	Which political level is your cooperative currently influencing? [federal]	Binary variable (yes = 1; no = 0)
<b>EU/transnational Current</b>	Which political level is your cooperative currently influencing? [European; transnational]	Binary variable (yes = 1; no = 0)
<b>Subnational Dissatisfaction</b>	How satisfied are you with energy policy on different political levels? [community; regional]	4 (= very unsatisfied) to 1 (= very satisfied); mean value of dissatisfaction with the community and regional level
<b>National Dissatisfaction</b>	How satisfied are you with energy policy on different political levels? [federal]	4 (= very unsatisfied) to 1 (= very satisfied)
<b>EU Dissatisfaction</b>	How satisfied are you with energy policy on different political levels? [EU]	4 (= very unsatisfied) to 1 (= very satisfied)
<b>Control variables</b>		
<b>Age</b>	When was your cooperative founded? Please state the year.	Reference year = 2017
<b>Membership</b>	How many members has your cooperative currently? Please state the quantity.	8 categories; 1 = smaller than 50 to 8 = greater than 1000
<b>Political engagement</b>	Does your cooperation follow political decisions regarding energy policy?	Binary variable (yes = 1; no = 0)
<b>Political ambition</b>	What of these before mentioned aims of your cooperative is the most important aim? [Political]	Binary variable (yes = 1; no = 0)
<b>Investment</b>	How much money has your cooperative invested in energy transformation projects so far? Please state the approximate volume in EUR.	4 categories; 1 = below 200.000 EUR to 4 = above 3 million EUR



**Table A6.** Results of the logistic regression models for the three outcomes variables and total level of future influence as a fourth outcome variable.

	Sub-Basic	Sub-Full	Nat-Basic	Nat-Full	EU-Basic	EU-Full	Tot-Basic	Tot-Full
Subnational Current	64.74 (54.46)***	64.43 (59.92)***						
National Current			36.98 (28.50)***	49.76 (41.80)***				
EU/transnational Current					74.15 (64.79)***	71.12 (67.48)***		
Current							58.42 (48.80)***	65.60 (60.66)***
Subnational Dissatisfaction	3.72 (1.94)**	3.49 (1.95)**	1.14 (0.37)	1.46 (0.54)	1.46 (0.52)	1.62 (0.65)	3.17 (1.60)**	3.42 (1.90)**
National Dissatisfaction	1.39 (0.84)	1.28 (0.83)	1.55 (0.68)	2.18 (1.10)	0.93 (0.46)	1.09 (0.58)	1.70 (1.05)	1.20 (0.79)
EU Dissatisfaction	0.76 (0.47)	0.83 (0.55)	0.83 (0.35)	0.78 (0.36)	1.31 (0.63)	1.22 (0.58)	0.64 (0.41)	0.88 (0.58)
Age		1.18 (0.20)		0.93 (0.12)		0.88 (0.12)		1.18 (0.19)
Membership		0.93 (0.25)		0.73 (0.14)*		0.74 (0.15)		0.92 (0.25)
Investment		0.85 (0.32)		2.30 (0.74)***		1.50 (0.45)		0.87 (0.33)
Political Engagement		1.12 (1.10)		3.56 (4.39)		3.05 (4.52)		1.08 (1.05)
Political Ambition		—		1.90 (1.94)		0.63 (0.80)		—
Cases	154	140	123	121	154	151	154	140
AIC	76.97	82.01	129.94	129.09	109.59	103.62	76.73	81.46

Notes: The table reports odds ratios; the models for the EU are estimated with the Firth correction; in Model Sub-Full and Model Tot-Full, the odds ratios for political ambition are omitted from the estimation routine because of this variable's dependence on other variables in the model. \*  $p < 0.10$ , \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

**Table A7.** Results of the logistic regression models without the first set of focal explanatory variables.

	Sub-Basic	Sub-Full	Nat-Basic	Nat-Full	EU-Basic	EU-Full	Tot-Basic	Tot-Full
Subnational Dissatisfaction	2.65 (1.02)**	2.14 (0.89)*	1.59 (0.41)*	1.75 (0.51)*	1.70 (0.46)**	1.87 (0.57)**	2.51 (0.97)**	2.14 (0.89)*
National Dissatisfaction	1.20 (0.52)	1.36 (0.69)	1.59 (0.55)	1.88 (0.72)*	0.93 (0.35)	1.13 (0.45)	1.38 (0.61)	1.36 (0.69)
EU Dissatisfaction	1.37 (0.61)	1.25 (0.62)	1.05 (0.36)	1.09 (0.40)	1.38 (0.51)	1.23 (0.45)	1.21 (0.55)	1.25 (0.62)
Age		1.09 (0.12)		1.10 (0.10)		0.99 (0.08)		1.09 (0.12)
Membership		1.17 (0.22)		0.85 (0.13)		0.77 (0.12)		1.17 (0.22)
Investment		0.73 (0.22)		1.55 (0.37)*		1.49 (0.37)		0.73 (0.22)
Political Engagement		8.55 (7.17)**		4.07 (3.73)		6.77 (10.00)		8.55 (7.17)**
Political Ambition		—		3.57 (2.79)		1.83 (1.29)		—
Cases	154	140	129	127	154	151	154	140
AIC	120.97	115.04	179.32	176.82	161.70	149.82	117.97	115.04

Notes: The table reports odds ratios; the models for the EU are estimated with the Firth correction; in Model Sub-Full and Model Tot-Full, the odds ratios for political ambition are omitted from the estimation routine because of this variable's dependence on other variables in the model. \*  $p < 0.10$ , \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

**Table A8.** Results of the logistic regression models without the first set of focal explanatory variables and a reduced set of variables for dissatisfaction.

	Sub-Basic	Sub-Full	Nat-Basic	Nat-Full	EU-Basic	EU-Full	Tot-Basic	Tot-Full
Subnational Dissatisfaction	2.80 (1.03)***	2.39 (0.93)**					2.51 (0.97)**	2.14 (0.89)*
National Dissatisfaction			1.97 (0.53)**	2.35 (0.68)***			1.38 (0.61)	1.36 (0.69)
EU Dissatisfaction					1.46 (0.44)	1.41 (0.42)	1.21 (0.55)	1.25 (0.62)
Age		1.08 (0.11)		1.11 (0.10)		0.99 (0.08)		1.09 (0.12)
Membership		1.22 (0.21)		0.95 (0.12)		0.86 (0.12)		1.17 (0.22)
Investment		0.64 (0.18)		1.37 (0.29)		1.21 (0.26)		0.73 (0.22)
Political Engagement		5.59 (4.18)**		5.98 (5.23)**		6.37 (9.30)		8.55 (7.17)**
Political Ambition		2.20 (2.49)		3.17 (2.25)		1.58 (1.09)		—
Cases	171	168	140	138	156	153	154	140
AIC	130.14	128.78	190.88	186.80	167.45	156.26	117.97	115.04

Notes: The table reports odds ratios; the models for the EU are estimated with the Firth correction; in Model Tot-Full, the odds ratios for political ambition are omitted from the estimation routine because of this variable's dependence on other variables in the model. \*  $p < 0.10$ , \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .